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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,314	12/23/2003	Reiki Watanabe		5573

7590 10/16/2008
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EXAMINER

KACKAR, RAM N

ART UNIT	PAPER NUMBER
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1792

MAIL DATE	DELIVERY MODE
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10/16/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/743,314

Applicant(s)

WATANABE, REIKI

Examiner

Ram N. Kackar

Art Unit

1792

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-25 and 32-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-25 and 32-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/1/2008 has been entered except for claims 26-31 which were withdrawn earlier.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 15, 21-24 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,991,934 to Walton et al. ("Walton").

Walton teaches a vessel having at least one fluid discharge port 20; a substrate holder 32 within the vessel 10 for supporting a substrate thereon; and a rotor 22 provided between the substrate holder and a side wall of the vessel, rotatably mounted for rotation around the substrate holder and having a vent hole or vent notch 26; and a rotary drive for rotating the rotor through shaft 40 (Col 2 lines 4-16), thereby alternately bringing the vent hole or vent notch into communication with the fluid discharge port for discharge of a fluid onto a substrate supported

by the substrate holder and closing the at least one fluid discharge port. (See, for example, Fig. 6, 7). Walton further teaches processing fluid and fluid ports. (See, for example, col. 1, lines 12-28). Further substrate holder 32 is attached to shaft 24 to rotate independently (Fig 8).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to utilize gas and gas discharge ports with the teachings of Walton

The suggestion/motivation would have been that fluids include gases and the teachings of Walton are not limited to liquids.

For claim 21, Walton teaches means for adjusting pressure and suppressing pressure variations. (See, for example, col. 2, lines 34-40).

Regarding claim 22, Walton teaches the substrate holder 32 is supported by an axially extending stem 24 defining a central axis, and the substrate holder is rotated around the central axis. (See, for example, Fig. 7).

For claim 23, Walton teaches means for heating 41 the substrate supported on the substrate holder. (See, for example, Fig. 6).

Regarding claim 24, Walton teaches exhaust means for reducing pressure inside of the vessel. (See, for example, Fig. 6).

Claims 33-34 are directed to an intended use.

3. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton as applied to claim 15 above, and further in view of US 2003/0079686 to Chen et al. ("Chen").

Regarding claim 16, Walton teaches the vessel has a plurality of discharge ports 20. (See, for example, Fig. 2).

Walton does not teach that the plurality of discharge ports include a reaction gas discharge port and a purge gas discharge port.

Chen teaches that atomic layer deposition involves sequential gas pulses, such as a first reactant gas pulse, followed by a purge gas pulse, followed by a second reactant gas pulse, and then a purge gas pulse. (See, for example, para. [0007]).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have reaction gas and purge gas discharge ports as the ports in Walton.

The suggestion/motivation would have been that Walton teaches pulsing of fluids through discharge ports, and reaction gases and purge gases are pulsed in atomic layer deposition.

For claim 17, Chen teaches the alternating introduction of reaction gases and purge gases (see, for example, para. [0007]) while Walton teaches multiple discharge ports around a circumference of the vessel (see, for example, Fig. 2). It would have been obvious to alternately arrange reaction gas discharge ports and purge gas discharge ports around a circumference of the vessel in order to introduce the gases in the proper sequence.

4. Claims 18-20, 25, 32 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton as applied to claim 15 above, and further in view of US 6,288,465 to Suzuki et al. ("Suzuki").

Regarding claim 18, Walton teaches an upper inner surface of a side wall of the vessel has a flat shape, and an upper outer surface of the rotor has a flat shape in conformity with the flat shape of the side wall of the vessel. (See, for example, Fig. 6).

Walton does not teach a floating gas.

Suzuki teaches at least one floating gas discharge port 48a, and the rotating body 41 is floated by gas introduced through the at least one floating gas discharge port so as to form a space between the upper inner surface of the side wall of the vessel and the upper outer surface of the rotor. (See, for example, Fig. 19).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate floating gas into the vessel in Walton.

The suggestion/motivation would have been that it is well known in the art to use gas bearings to assist in rotation. (Suzuki, col. 1, line 17 – col. 2, line 16).

For claim 19, Suzuki teaches a plurality of floating gas discharge ports 48a around a circumference of the inner surface of the side wall of the vessel. (See, for example, Fig. 19).

Regarding claim 20, Suzuki teaches the floating gas exhausted via an exhaust port that is provided at the inner surface of the side wall of the vessel. (See, for example, Fig. 19).

For claim 25, Suzuki teaches control means 57 for adjusting partial pressure of the floating gas (See, for example, Fig. 19) while Walton teaches means for controlling direction of rotation and rotational speed of the rotor (See, for example, col. 2, lines 48-57).

Regarding claim 32 the shape of the rotor was a matter of choice.

It was held in *re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) that the shape was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular shape was significant. (Also see MPEP 2144.04(d)).

Response to Arguments

Applicant's arguments filed 7/1/2003 have been fully considered but they are not persuasive.

As discussed above the rotor and substrate holder can rotate with respect to each other and therefore they are independent to each other.

Regarding claims 16 and 17 it is obvious to use the disclosed apparatus for reaction gas or purge gas.

Similarly using air bearings in place of conventional bearing would be obvious. Regarding seals air bearings could be independent of seals.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ram N Kackar/
Primary Examiner, Art Unit 1792